

WHAT IS CLAIMED IS:

1. A rechargeable lithium battery including a positive electrode, a negative electrode and a nonaqueous electrolyte, wherein an Li alloying metal is used as active material of at least one of said positive and negative electrodes and said metal active material is covered with a thin film which is nonreactive with Li ions, permits passage of Li ion but does not have an Li ion conductivity.

2. The rechargeable lithium battery of claim 1, wherein said thin film is a hard carbon thin film.

3. The rechargeable lithium battery of claim 2, wherein said hard carbon thin film shows two peaks Id and Ig in the Raman scattering spectrum, around  $1400\text{ cm}^{-1}$  and  $1550\text{ cm}^{-1}$ , with a ratio (Id/Ig) in intensity of 0.5 to 3.0.

4. The rechargeable lithium battery of claim 1, wherein said thin film has a thickness of 50 to 1,000 nm.

5. The rechargeable lithium battery of claim 1, wherein said thin film has a volume resistivity of not exceeding  $10^{10}\text{ }\Omega\cdot\text{cm}$ .

6. The rechargeable lithium battery of claim 1, wherein an interlayer is provided between said thin film and metal active material.

7. The rechargeable lithium battery of claim 6, wherein said interlayer is formed from at least one selected from Si, Ti, Zr, Ge, Ru, Mo and W and their oxides, nitrides and

carbides.

8. The rechargeable lithium battery of claim 1, wherein said metal active material is provided in a film form.

9. The rechargeable lithium battery of claim 8, wherein said thin film is disposed on both sides of said film-form metal active material.

10. The rechargeable lithium battery of claim 1, wherein said metal active material is at least one metal selected from Si, Ge, Sn, Al, In and Mg.